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Determinants of Current Account Deficits in Developing Countries

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In developing countries, increases in current account deficits tend to be associated with a rise in domestic output growth and shocks that increase the terms of trade and cause the real exchange rate to appreciate. Higher savings rates, higher growth rates in industrial economies, and higher international interest rates tend to have the opposite effect.

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Summary findings

Calderón, Chong, and Loayza examine the empirical links between current account deficits and a broad set of economic variables proposed in the literature.

To accomplish this, they complement and extend previous research by using a large, consistent set of macroeconomic data on public and private domestic savings, external savings, and national income variables; focusing on developing economies by drawing on a panel data set for 44 developing countries and annual information for the period 1966–95; adopting a reduced-form approach rather than holding to a particular structural model; distinguishing between within-country and cross-country effects; and employing a class of estimators that controls for the problems of simultaneity and reverse causation.

Among their findings:

- Current account deficits in developing countries are moderately persistent.
- A rise in domestic output growth generates a larger current account deficit.
- Increases in savings rates have a positive effect on the current account.
- Shocks that increase the terms of trade or cause the real exchange rate to appreciate are linked with higher current account deficits.
- Either higher growth rates in industrial economies or higher international interest rates reduce the current account deficit in developing economies.

This paper—a product of the Regional Studies Program, Latin America and the Caribbean Region—is part of an effort in the region to understand the determinants of external sustainability. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Hazel Vargas, room I8-138, telephone 202-473-8546, fax 202-522-2119, email address hvargas@worldbank.org. Policy Research Working Papers are also posted on the Web at www.worldbank.org/research/workingpapers. The authors may be contacted at crcn@troi.cc.rochester.edu, achong@worldbank.org, or nloayza@condor.bcentral.cl. July 2000. (37 pages)

DETERMINANTS OF CURRENT ACCOUNT DEFICITS IN DEVELOPING COUNTRIES

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DETERMINANTS OF CURRENT ACCOUNT DEFICITS IN DEVELOPING COUNTRIES

1. INTRODUCTION

Recent macroeconomic crises in developing countries have once again underscored the need for a clear understanding of the factors underlying a country's current account position. Despite the relatively extensive body of theoretical literature on the subject, there are only a few comprehensive cross-country studies that empirically analyze the effect of macroeconomic variables on the current account deficit.[1] This lack of cross-country empirical evidence is surprising given the fact that the position of the current account is typically used as one of the main leading indicators for future behavior of an economy and is part of the everyday decision process of policy makers. The objective of this paper is to examine the empirical linkage between current account deficits and a broad set of economic variables proposed by the theoretical and empirical literature. In order to accomplish this task, we intend to complement and extend previous empirical research by:

- Using a large and consistent macroeconomic data set on public and private saving rates, as well as other national income variables (the World Saving Database; see Loayza, López, Schmidt-Hebbel, and Servén, 1998).
- Focusing on developing countries by drawing on a panel data set consisting of 44 developing countries and annual information for the period 1966-95.
- Adopting a reduced-form approach (instead of holding to a particular structural model) that includes a "pool" of determinants of current account deficits identified in the literature of international economics.
- Estimating separately the within-country and cross-country relationships between the current account deficit and its determinants.
- Employing a class of estimators that controls for the problems of joint endogeneity of the explanatory variables (simultaneity and reverse causation) and correlated unobserved

country-specific effects (i.e. country heterogeneity) [see Arellano and Bond, 1991; and Arellano and Bover, 1995].

Unlike typical developed countries, most developing countries are credit constrained. Both the behavior and response of the current account deficit to changes in internal and external conditions are thus likely to be different in the latter. We acknowledge this possible different behavior and also take into account the scarcity of empirical research on developing countries, and thus concentrate our study on them. The paper is organized as follows. The next section presents a brief review of the theoretical and empirical literature. Section 3 describes the data. Section 4 presents the econometric methodology to estimate within-country and cross-country effects. Section 5 discusses the results. Section 6 concludes.

2. REVIEW OF THE LITERATURE

According to the intertemporal approach, the current account deficit is the outcome of forward-looking dynamic saving and investment decisions driven by expectations of productivity growth, government spending, interest rates, and several other factors. Within this framework, the current account balance behaves as a *buffer* against transitory shocks in productivity or demand (Sachs, 1981; Obstfeld and Rogoff, 1995, 1996; Ghosh, 1995; Razin, 1995). One of the main lessons from this literature is that the impact of economic changes on the current account balance may vary according to their origin, persistence and timing of such changes. With respect to their origin, shocks may be *country-specific* or *global*. Telling them apart is important since the literature finds that, for instance, global productivity shocks have a smaller impact on current account deficits than country-specific shocks (Glick and Rogoff, 1995; Razin, 1995). Similarly, the persistence of the shocks, whether *transitory* or *permanent*, may produce a different response of the current account balance. For example, a permanent productivity shock may widen the current account deficit as it may generate a surge in investment and a decline in savings (given that it causes consumption to rise by more than gross output). On the other hand, transitory productivity shocks may move the current account into surplus, as there may be no investment

response to a purely temporary shock (Glick and Rogoff, 1995; Obstfeld and Rogoff, 1995). Finally, the timing of shocks, in particular, the extent to which they are expected or unexpected by agents in the economy, may also matter in current account outcomes. In this paper, we take into account how the nature of economic changes impact on the current account by distinguishing effects due to overtime changes within a country, the evolution of the world economy, and structural differences across countries. The first two mostly capture dynamic effects where transitory shocks are predominant, while current account outcomes due to cross-country differences mostly capture structural effects, where long-run factors play a large role.

In the context of a real business cycle model, the intertemporal approach has been widely used to evaluate the impact on the current account balance of fiscal policy (Leiderman and Razin, 1991; Frenkel and Razin, 1996), real exchange rate (Stockman, 1987), terms of trade fluctuations (Obsfeld, 1982; Svensson and Razin, 1983; Greenwood, 1983; Mendoza, 1995; Tornell and Lane, 1998; Mansoorian, 1998), capital controls (Mendoza, 1991) and global productivity shocks (Glick and Rogoff, 1995; Razin, 1995.)[2] In assessing the effects of these variables, the RBC literature has been careful to recognize that dynamic general equilibrium models imply the existence of simultaneity between the current account deficits and its determinants. The same care has not been exercised in most traditional econometric studies. Although primarily used to explain current account fluctuations at business cycle-frequencies, the intertemporal approach has attempted to introduce life-cycle implications to explain trend developments. In this regard, the literature on current account sustainability (Milesi-Ferreti and Razin, 1996) has proved to be a useful complement.[3] However, there are still unsolved issues regarding the factors that could trigger a policy reversal in situations of unsustainability. Events that might generate policy shifts are different across countries, and might reflect different degrees of vulnerability to external shocks, or differences in the ability to undertake policy adjustments.[4]

So far the empirical literature has focused on particular aspects only. Moreover, most of the studies are mainly focused on industrial countries, either as a group or individually, and

typically with emphasis on the response of the current account balance to shocks in one specific determinant (see Table 1 for a summary of the findings of the empirical literature). An example of this emphasis on specific variables is given by the several studies that deal with terms of trade shocks. Its influence has been evaluated using different econometric techniques (Marquez *et al.*, 1988; Marquez, 1990, 1991; Rose and Yellen, 1989; Debelle and Faruqee, 1996) and using calibration and simulation of RBC models for both industrial economies (Backus, Kehoe, and Kydland, 1994) and developing countries (Mendoza, 1995; Senhadji, 1998). Another example is fiscal policy. Not only has it been evaluated with impulse-response functions from simulations of dynamic general equilibrium models (Leiderman and Razin, 1991; Frenkel, Razin, and Yuen, 1996), but also with econometric techniques –VAR and panel data analysis (Glick and Rogoff, 1995; Debelle and Faruqee, 1996).

As important as the above studies are, comprehensive cross-country empirical studies on the determinants of the current account balance are quite scarce. An early attempt to provide a more comprehensive characterization of the current account behavior was performed by Kahn and Knight (1983). They use a "pooled" time-series cross-section data for 32 non-oil developing countries during over the period 1973-80[5]. They find that external factors (captured by rising foreign real interest rates, slowdown in the growth rate of industrial countries, and the secular decline in the terms of trade) as well as domestic factors (as represented by increasing fiscal deficits and real exchange rate appreciation) were relevant in explaining the deterioration of the current account of non-oil developing countries. Similarly, Marquez (1990), and Hooper *et al.* (1998) systematically compute aggregate income and price elasticities that are consistent with bilateral trade elasticities for both developing and developed countries. However, the work that is closest in spirit to our research is Debelle and Faruqee (1996). They use a panel of 21 industrial countries over 1971-93 and an expanded cross-sectional data set that includes an additional 34 industrial and developing countries. Their paper attempts to explain long-term variations and short-run dynamics of the current account by specifying cross-section and panel data models,

respectively. Debelle and Faruqee find that the fiscal surplus, terms of trade and capital controls do not play a significant role on the long-term (cross-sectional) variations of the current account, while relative income, government debt and demographics do. Furthermore, with the purpose of estimating short-run effects, Debelle and Faruqee estimate both a partial-adjustment model with fixed-effects and an error-correction model (to account, respectively, for the possibilities of stationarity or non-stationarity of the ratio of net foreign assets to GDP). In both cases, they find that short-run changes in fiscal policy, movements in terms of trade, the state of the business cycle, and the exchange rate affect the current account balance. We complement Debelle and Faruqee's approach by applying recent econometric techniques to control for joint endogeneity and by distinguishing between within-country and cross-country effects. Our aim is to take a rather comprehensive approach with emphasis on LDCs, as our expanded data set allows.

3. DATA

We use an unbalanced panel of 753 annual observations from 44 developing countries over the period 1966-95. In order to ensure a minimum time-series dimension and allow adequate implementation of our econometric methodology, we only consider countries that have at least six consecutive annual observations. The following are the key variables used[6]:

Income, Current Account, and Saving. The measure of income employed to construct and normalize both the current account balance and national saving is gross national disposable income *(GNDI)*. This corresponds closely to the concept of total income available for consumption and saving of national residents and is equal to gross national product *(GNP)* plus all net unrequited transfers from abroad. Gross national saving *(GNS)* is computed as *GNDI* minus consumption expenditure, and the current account deficit *(CAD)* is the difference between gross domestic investment *(GDI)* and gross national savings *(GNS)*. We normalize the current account deficit and public and private saving by dividing each of them by *GNDI*. Data on income, saving, and investment is taken from the World Saving Database (Loayza et al., 1998).

Public and Private Saving. We employ a broad definition of the public sector that includes central and local governments as well as non-financial public enterprises. Furthermore, we use adjusted saving data for capital gains and losses that accrue to the public and private sectors as a result of inflation (that is, the erosion of the real value of non-indexed public debt). The source of these variables is the World Saving Database (Loayza et al., 1998).

Exchange Rate. The effective real exchange rate was calculated as:

$$TCR = \frac{(P/e)}{\prod_k (P_k / e_k)^{\delta_k}}$$

where P is the consumer price index of the domestic country, e is the exchange rate (price of the US dollar in units of local currency), P_k and e_k are the consumer price index and exchange rate for the trading partners, and δ_k represent the IMF-generated weights based on both bilateral trade shares and export similarity. An increase in the real exchange rate implies a real appreciation of the domestic currency.

Balance of Payments Controls and Black Market Premium on Foreign Exchange. Grilli and Milesi-Ferreti (1995) construct dummy variables on three forms of BoP restrictions: (i) payments for capital transactions; (ii) multiple exchange rate practices; and (iii) restrictions on current account transactions.[7] We use a simple average of (i), (ii), and (iii) as a first proxy of BoP restrictions. Following Dooley and Isard (1980), we use the black market premium on foreign exchange as an alternative measure of capital and current account controls. Employing this variable may be particularly important in empirical analysis that uses relatively high (annual) frequency data. Data on black market premium is obtained from Wood (1988) and International Currency Analysis Inc. (various years).[8]

Industrialized Output Growth Rate and International Interest Rates. The first is computed from dollar-denominated real GDP of OECD countries. For the second, we use the nominal

Eurodollar London rate, adjusted with the CPI percentage change for industrial countries. The source is the IMF International Financial Statistics.

4. ECONOMETRIC METHODOLOGY

We work with pooled time-series and cross-country data. Taking advantage of the nature of this data set, we identify and differentiate within-country and cross-country effects. Whereas the former emphasize the current-account response to over-time changes in a given country, the latter consider how the differences in current-account deficits across countries are driven by their respective characteristics. Within-country effects are dynamic in nature and require relatively high-frequency data to be identified. Cross-country effects focus on trends and are best identified using relatively low-frequency data, which dampens the importance of business-cycle fluctuations.

In addition, our model considers inertial properties in the current account deficit by allowing for an independent effect from its lagged value. Finally, our estimation method relaxes the common assumption of strong exogeneity of the explanatory variables, thus allowing for (limited) reverse causality and simultaneity.

4.1. Within-country and cross-country Effects

We estimate the within-country effects with a model that controls for country-specific factors. This model allows us to de-emphasize the cross-sectional variation of the data in favor of its time-series counterpart. In this sense, our method is akin to the common fixed-effects estimator (Mundlak 1978, Anderson and Hsiao 1982); in contrast, however, our method allows for joint endogeneity, as we discuss below. For the estimation of the within-country effects, the frequency of the time-series data is annual, which is the highest available for our set of variables and countries. The regression equation for the within-effects model is given by,

$$y_{it} = \beta_1 y_{it-1} + \beta_2 X_{it} + \eta_i + \varepsilon_{it} \qquad (1)$$

where, y_{it} is the current account deficit, as a ratio to national income, of country i in year t; X_{it} is a set of its economic determinants; and η_i represent country-specific factors.

The estimation of cross-country effects is based on a regression on time-averaged data. In order not to minimize the cross-country variation, country-specific factors are not controlled for. Furthermore, using period averages allows us to concentrate on the cross-sectional variation and mostly abstract from business-cycle fluctuations. However, we do not work with averages over the whole 1966-95 period; rather we work with non-overlapping five-year periods. We break the sample period in order to, first, allow for inertial effects and, second, implement our method to control for joint endogeneity (which, as explained below, is based on using lagged values of the variables as instruments.)[9] The regression equation for the estimation of cross-country effects is given by,

$$y_{i\tau} = \alpha_1 y_{i\tau-1} + \alpha_2 X_{i\tau} + \mu_{i\tau} \tag{2}$$

where the index τ denotes a given five-year period.

4.2. Joint Endogeneity

Our models of within-country and cross-country effects are dynamic (i.e., the set of explanatory variable includes a lag of the dependent variable) and include some explanatory variables that are potentially jointly endogenous (in the sense of being correlated with the error term). In addition, the model of within-country effects presents an unobserved country-specific factor, which is correlated with the explanatory variables. Our preferred method of estimation is the Generalized Method of Moments estimator for dynamic models of panel data introduced by Arellano and Bover (1995) and Blundell and Bond (1997). In what follows, we describe the methodology used to consistently and efficiently estimate the within-country effects model. The estimation of the cross-country effects model follows similar lines but is simpler given that it does not control for country specific factors. At the end of this section we highlight the differences in estimation between the two.

To control for country-specific factors and joint endogeneity, we use Arellano and Bover's *system GMM* estimator. This estimates in a system the regression equations in differences and levels, each with its specific set of instrumental variables. For ease of exposition, we discuss each section of the system, though actual estimation is performed using the whole system jointly. Specifying the regression equation in differences allows direct elimination of country-specific factors. First-differencing equation (1) yields,

$$y_{i,t} - y_{i,t-1} = \beta_1\left(y_{i,t-1} - y_{i,t-2}\right) + \beta_2\left(X_{i,t\cdot} - X_{i,t-1}\right) + \left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right) \tag{3}$$

The use of instruments is required to deal with two issues: first, the likely endogeneity of the explanatory variables, X, which is reflected in the correlation between these variables and the error term; and, second, the new error term, $(\varepsilon_{i,t} - \varepsilon_{i,t-1})$, is correlated by construction with the differenced lagged dependent variable, $(y_{i,t-1} - y_{i,t-2})$. Instead of assuming strict exogeneity (that is, the explanatory variables be uncorrelated with the error term at all leads and lags), we allow for the possibility of simultaneity and reverse causation. We adopt the more flexible assumption of weak exogeneity, according to which current explanatory variables may be affected by past and current realizations of the dependent variable but not by its future innovations. Under the assumptions that (a) the error term, ε, is not serially correlated, and (b) the explanatory variables are weakly exogenous, the following moment conditions apply:

$$E\left[y_{i,t-s} \cdot \left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right)\right] = 0 \quad for\ s \geq 2; t = 3, \ldots, T \tag{4}$$

$$E\left[X_{i,t-s} \cdot \left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right)\right] = 0 \quad for\ s \geq 2; t = 3, \ldots, T \tag{5}$$

The GMM estimator simply based on the moment conditions in (4) and (5) is known as the *differences* estimator. Although asymptotically consistent, this estimator has low asymptotic precision and large biases in small samples, which leads to the need to complement it with the regression equation in levels.[10]

For the regression in levels, the country-specific factor is not directly eliminated but must be controlled for by the use of instrumental variables. The appropriate instruments for the regression in levels are the lagged *differences* of the corresponding variables if the following assumption holds. Although there may be correlation between the levels of the right hand side variables and the country-specific effect, there is no correlation between the *differences* of these variables and the country-specific effect. This assumption results from the following stationarity property,

$$E\left[y_{i,t+p}\cdot\eta_i\right]=E\left[y_{i,t+q}\cdot\eta_i\right] \;\; and \;\; E\left[X_{i,t+p}\cdot\eta_i\right]=E\left[X_{i,t+q}\cdot\eta_i\right] \;\; for\ all\ p\ and\ q \tag{6}$$

Therefore, the additional moment conditions for the second part of the system (the regression in levels) are given by the following equations:[11]

$$E\left[\left(y_{i,t-s}-y_{i,t-s-1}\right)\cdot\left(\eta_i+\varepsilon_{i,t}\right)\right] = 0 \quad for\ s=1 \tag{7}$$

$$E\left[\left(X_{i,t-s}-X_{i,t-s-1}\right)\cdot\left(\eta_i+\varepsilon_{i,t}\right)\right] = 0 \quad for\ s=1 \tag{8}$$

Using the moment conditions presented in equations (4), (5), (7) and (8), and following Arellano and Bond (1991) and Arellano and Bover (1995), we employ a Generalized Method of Moments (GMM) procedure to generate consistent estimates of the parameters of interest.[12] The consistency of the GMM estimator depends on whether lagged values of the explanatory variables are valid instruments in the current account deficit regression. We address this issue by considering two specification tests suggested by Arellano and Bond (1991) and Arellano and Bover (1995). The first is a Sargan test of over-identifying restrictions, which tests the overall validity of the instruments by analyzing the sample analog of the moment conditions used in the estimation process. Failure to reject the null hypothesis gives support to the model. The second test examines the hypothesis that the error term $\varepsilon_{i,t}$ is not serially correlated. We test whether the differenced error term (that is, the residual of the regression in differences) is first-, second-, and third-order serially correlated. First-order serial correlation of the differenced error term is

expected even if the original error term (in levels) is uncorrelated, unless the latter follows a random walk. Second-order serial correlation of the differenced residual indicates that the original error term is serially correlated and follows a moving average process at least of order one. If the test fails to reject the null hypothesis of absence of second-order serial correlation, we conclude that the original error term is serially uncorrelated and use the corresponding moment conditions. Finally, given that the cross-country effects model must not control for country-specific factors, estimation is performed with a levels specification for both the regression equation and the instrumental variables. Allowing for weak endogeneity of the explanatory variables entails the use of instruments but, since there is no country-specific effect to control for, these instruments can simply be the lagged *levels* of the explanatory variables. The two tests of specification outlined in the previous section can be applied to the estimation of this model, with the modification that, for the serial correlation test, the model will be misspecified if we find evidence of *first*-order serial correlation.

5. RESULTS

The dependent variable is the current account deficit as ratio to gross national disposable income *(GNDI)*. The set of core explanatory variables is chosen on the basis of their relevance in the literature. They are the lagged current account deficit, the domestic output growth rate, private and public saving ratios with respect to *GNDI*, the share of exports in *GNDI*, the real effective exchange rate, the terms of trade, the extent of balance of payment controls, the black market premium, the output growth rate of industrialized countries, and the international real interest rate. The explanatory variables are allowed to be jointly (weakly) endogenous, except for the terms of trade, the industrialized output growth rate, and the international real interest rate, variables which in our developing-country sample are most likely exogenous. Table 2 shows summary statistics on all variables for both the sample of developing countries and the sub-sample of heavily-indebted countries.

5.1. Within-Country Effects

We now present the estimation results of the within-country effects regarding the relationship between the current account deficit and its domestic and international determinants. First, we discuss the results obtained with the full sample of developing countries. Then, we compare the results obtained for a sample of highly indebted countries. Table 3 reports the current account regressions using alternative estimators on the sample of developing countries and employing the core specification. For the reasons outlined in the previous section, our preferred estimation method is the GMM system estimator. The other two alternative estimators have their particular shortcomings. Thus, the *fixed-effects OLS* estimator eliminates the country-specific effect but does not account for the joint endogeneity of the explanatory variables.[13] The *differences GMM* estimator accounts for both joint endogeneity and country-specific factors but eliminates valuable information and uses weak instruments. Notice that the specification tests support the *system GMM* panel estimator. The test of over-identifying restrictions (i.e. Sargan test) can not reject the null hypothesis that the instruments are uncorrelated with the error term. Moreover, serial correlation tests do not reject the hypothesis that the differenced error term is not second- or third-order serially correlated (while rejecting that it is not first-order serially correlated). The two specification tests support the use of (appropriate) lags of the explanatory variables as instruments for estimation.[14] The Sargan test only marginally supports the specification of the *differences GMM* estimator. In the case of the *fixed-effects OLS* estimator, there is no counterpart to the Sargan test given that they do not rely on instrumental variables. Below we discuss the effects of each "core" explanatory variable on the current account deficit (Table 3). For each variable, the *system GMM* estimator is discussed first and then compared with those obtained under alternative techniques. We also discuss the effects of a few additional variables (Table 4), partly to allow comparison with the model of cross-country effects and partly to test for robustness of the "core" variables.

Persistence. The coefficient of the lagged current account deficit (as ratio to GNDI) is positive and significant, estimated at around 0.36. The size of this coefficient reveals moderate persistence of transitory shocks, implying that the half-life of these shocks on the current account deficit is about 1.67 years. The finding of moderate persistence is in line with the notion that, controlling for country-specific factors, the current account deficit is stationary.[15] The alternative estimators obtain quite similar results regarding the size and significance of the lagged current-account deficit.

Internal Economic Conditions:

Public and Private Saving. An increase in either public or private saving rates contributes to decrease the current account deficit. However, whereas the coefficient on the public saving rate is strongly statistically significant, the one on the private saving rate is only marginally so. According to the estimated coefficients reported in column 5, the effect of an increase in the public saving rate of 1 percentage point leads to a CAD fall of 0.35 percentage points; the corresponding figure for the private rate is 0.13, that is, almost three times smaller. Then, it appears that shocks in private saving rates are accompanied almost one-to-one by investment rate shocks, whereas shocks in public saving rates are only partially offset by increases in the investment rate. A practical implication derived from this result is that when short-run improvement of the current account deficit is needed, an increase in public saving is a mildly effective policy option. The impact of rises in private and public saving rises on the current account deficit is robustly negative and significant across all considered estimators. Although the size of these two estimated coefficients varies across estimators, a robust result is that the coefficient on the public saving rate is larger than the corresponding one on private saving.

Domestic output growth. An increase in the domestic output (GDP) growth rate has the effect of enlarging the current account deficit. A 1 percentage point rise in the GDP growth rate leads to an increase of about 0.21 percentage points in the current account deficit. Although a rise in growth may be associated with an increase in the saving rate, it seems that its correlation with the

investment rate is somewhat larger, thus leading to a worsening of the current account deficit. If the increase in growth rates were solely the result of a temporary productivity surge, then it would be expected to move the current account towards surplus (see Glick and Rogoff, 1995). The coefficient on domestic output growth is robustly positive and significant across all estimators. The size of this estimated coefficient seems to be larger when weak endogeneity is allowed and accounted for (*differences GMM* and *system GMM*). This is consistent with the notion that a larger current account deficit brings about poorer growth performance; this negative effect would be controlled for through the use of the GMM estimators.

In Table 4, we examine the effect of two other variables dealing with internal economic conditions. The first is the ratio of ***liquid liabilities*** to GDP, whose high-frequency changes measure mostly monetary and credit expansions. Its effect on the current account deficit is positive and significant. Its likely mechanism is through the interest rate: a monetary expansion leads to an interest rate drop, which in turn encourages investment and, in the absence of an important saving effect, a rise in the current account deficit. The second variable is the standard deviation of ***inflation,*** which serves as a measure of macroeconomic uncertainty. Its effect on the current account deficit is negative and significant. This is consistent with the notion that macroeconomic uncertainty both lowers investment and, through a precautionary saving motive, rises saving -- both effects leading to a lower current account deficit (see Gosh and Ostry, 1997).

External Economic Conditions:

Exports. A temporary increase in exports, relative to GNDI, has the effect of lowering the current account deficit, most likely through its positive impact on the trade balance. This result is robust across alternative estimators. However, although this effect is statistically significant, its economic impact is quite small. An increase in the ratio of exports to GNDI of 5 percentage points leads to a CAD reduction of about 0.2 percentage points.

Real Exchange Rate. We find a significant relationship between the real exchange rate and the current account deficit that is consistent with the predictions of the Mundell-Fleming model. A

depreciation of the domestic currency (that is, a fall in the real effective exchange rate) has the effect of reducing the current account deficit, though by a small amount. Thus, a 10% depreciation of the real exchange rate leads to a temporary current account deficit reduction of 0.34 percentage points. Recent evidence argues that the relationship between the real exchange rate fluctuations and current account deficits may not be monotonic.[16] Thus, we study the delayed effects of the real exchange rate on the current account deficit in Table 4 by including the RER lagged one year as an additional regressor. First, we find no evidence in support for the J-curve hypothesis (as it applies to yearly data; regarding higher frequencies, clearly we have nothing to say).[17] Second, the contemporaneous positive impact of changes in the RER is offset by about half the following year. The "net" effect (adding the coefficients on contemporaneous and lagged RER in Table 4, column 4) is quite similar to the coefficient of the RER in the core specification. Regarding the alternative estimators, none of them obtain statistically significant coefficients for the real effective exchange rate.

Terms of Trade. We find a negative and significant relationship between changes in the terms of trade and current account deficits, which is consistent with the Harberger-Laursen-Metzler effect (Obstfeld, 1982; Svensson and Razin, 1983; Greenwood, 1983; Mendoza, 1992, 1995).[18] Hence, according to our preferred estimation, an increase of 10% in the terms of trade will reduce the current account deficit in 0.44 percentage points. Only the estimators that both control for country-specific effects and allow for (weak) joint endogeneity obtain significant (and negative) coefficients for the terms of trade.

Balance of Payments Controls. Raising BoP controls has no significant effect on the current account deficit; Debelle and Faruqee (1996) obtain a similar result. One caveat to consider in interpreting this result is that the proxies on BoP controls we use vary very little over time and do not measure accurately the *intensity* of controls, but only their presence (as stressed by Grilli and Milesi-Ferreti, 1995). The lack of significance of the coefficient on BoP controls seems to be robust across alternative estimators.

Black Market Premium on Foreign Exchange. In contrast to the BoP controls examined above, controls on the exchange rate manifested in the size of the black market premium have the effect of decreasing the current account deficit. The effect is statistically significant, although economically rather small. Imposing foreign exchange controls that result in an increase in the black market premium from 0 to 20% lead to a decrease in the current account deficit of 0.6 percentage points. The *fixed-effects* OLS estimator obtains similar results in size and significance, but the *difference* GMM estimator does not.

Evolution of the World Economy:

Output Growth Rate of Industrialized Countries. An increase in the growth rate of industrialized countries leads to a reduction in the current account deficits of developing countries. This can be explained by both a rise in the demand for the exports of developing countries and increased capital flows between industrialized countries at the expense of flows to developed countries. Our estimates indicate that a 1 percentage point rise in the growth rate of industrial countries would generate a reduction of 0.46 percentage points in the current account deficit. This result is quite robust, in sign, size, and significance, across alternative estimators.

International Real Interest Rate. We find a negative association between the international real interest rate and the current account deficit in developing countries. This result is in line with the argument that net debtor countries, as most developing countries are, widen their demand for international capital in response to interest rate reductions (Reisen, 1998). On the side of the supply of capital, lower real interest rates induce international investors to look for investment opportunities in developing countries (Milesi-Ferreti and Razin, 1996 and 1998). According to our estimates, a rise in international real interest rates of 1 percentage point leads to a current account deficit reduction of about 0.18 percentage points. In contrast to the industrialized countries growth rate, the estimated coefficient on the international real interest rate varies considerably across alternative estimators.

5.2. External Indebtedness

A country's current account deficit is likely to be affected by its stock of foreign assets. More specifically, it is likely that the stock of foreign assets affects the response of the current account deficit to changes in various economic variables. We would like to study this conjecture. Unfortunately, data on foreign asset positions are mostly unavailable for a large sample of developing countries. However, we do have data on total external debt (mostly from the World Bank), which can be used as indicator of a country's net foreign asset position (NFA). For most of our sample, external debt is a good indicator of NFA given that by far external financing has taken the form of debt issues; this assumption is less appropriate in the most advanced developing countries and in the most recent years. Our approach to analyze the influence of external indebtedness is to estimate our core model on the sample of "heavily" indebted developing countries and, for comparison purposes, on the sample of all developing countries with external debt data available. We follow the World Bank criterion (in the World Development Indicators) by which a "heavily" indebted country/year is one that has either the ratio of external debt to GDP higher than 50% or the ratio of total debt service to exports greater than 25%. We need to account for the fact that being a heavily indebted country has repercussions that extend beyond the year at which the criterion is met; furthermore, we need to smooth the (over time) country composition of both samples in order to be able to use our dynamic panel procedures. Therefore, we modify the World Bank criterion in the following way: a country is classified as heavily indebted in a given year if it meets the above condition in any two years of the five year window surrounding the year in question. The results are presented in Table 5. The first thing to notice is that the heavily-indebted country sample is almost 80% of the sample containing all developing countries. Most developing countries have suffered of long periods of high external indebtedness. Not surprisingly, the results for both samples are quite similar. There are, however, a couple of noteworthy differences. First, an increase in the private saving rate lowers the current account deficit only in the case of highly indebted countries. It appears that in non-

heavily indebted countries, which are likely to face less stringent external borrowing constraints, an increase in private saving is accompanied by a corresponding rise in domestic investment. Second, in contrast to the result for all developing countries, a fall in international real interest rates does not have a significant effect on the current account deficits of heavily indebted countries have. From the perspective of the supply of capital, this result indicates that international investors tend to avoid putting their capital in debt-ridden countries, even if real interest rates fall in developed countries.

5.3. Cross-Country Effects

Table 6 shows the results related to the estimation of cross-country effects for both the full sample and the sample of heavily indebted countries. Here the discussion of results follows a different format with respect to the previous sub-section; we now emphasize how the cross-country effects compare with the within-country effects. Also, we compare the results obtained with the sample of heavily indebted countries. As expected, the lagged current account deficit has a positive and highly significant coefficient. The finding of a moderate degree of ***persistence*** in the sample is consistent with the observation that while some countries tend to stay at certain current account levels for long periods of time, others experience sudden changes. Note that the level of persistence is much smaller in the case of heavily indebted countries, a group prone to current account reversals. Other variables that have similar effects in the within-country and cross-country models are the domestic and industrialized growth rates and the international real interest rate. Countries with a higher ***domestic growth rate*** have larger current account deficits, though the statistical significance of this effect is marginal. On the other hand, in periods when the ***industrialized output growth rate*** or ***the international real interest rate*** are larger, the current account deficit of developing countries is reduced. Given that these international variables do not vary across countries but only over time, it is natural that their effects be similar for the within-country and cross-country models. Conversely, the cross-country results related to the ***private and public saving rates*** differ from those of within-country effects: Countries with higher saving

rates do not appear to have higher or lower current account deficits. In other words, countries with higher saving rates also have higher investment rates. An exception of this result occurs in the sample of heavily indebted countries, for which countries with higher private saving present lower current account deficits. This result can be explained by considering that heavily-indebted countries must destine increases in available resources to paying off their debts.

Countries with larger ***exports*** (relative to GNDI) present bigger current account deficits; this result contrasts with the effect of exports in the within-country model. It seems that while an increase in exports from one year to the next lowers the current account deficit through a direct effect on the trade balance, having a large export sector indicates an improved capacity to repay external debts and, thus, leads to an expansion of the current account deficit (Milesi-Ferreti and Razin, 1996).[19] Again in contrast to the results related to the within-country effects model, the ***black market premium on foreign exchange*** and the measure of ***BoP restrictions*** have, respectively, positive and negative coefficients, both statistically significant. It appears that countries having a larger black market premium also have larger current account deficits. Thus, although foreign currency restrictions may limit the expansion of the current-account deficit in the short run, they are associated with macroeconomic mismanagement and higher external imbalances in the long run. On the other hand, countries with stricter BoP restrictions appear to limit the size of their current account deficit. The sign and size of the coefficients related to exports, black market premium, and BoP restrictions estimated using the full sample are quite similar to those using the sample of heavily indebted countries; however, the latter are estimated with less precision. Regarding the ***real exchange rate*** and the ***terms of trade***, neither have a significant coefficient in the cross-country effects model. The non-significance of the coefficients on the real exchange rate and terms of trade in this model is not surprising for two reasons. First, changes in these variables mainly affect the inter-temporal allocation of saving and investment; and second, their low frequency variation is quite small, particularly when compared to their annual fluctuations. Both inter-temporal changes and high-frequency variation

are considered in the within-country effects model, where both the real exchange rate and the terms of trade are found to be significant determinants of the current account deficit.

5.4. Additional Cross-Country Results

In Table 7, we consider some popular hypothesis regarding the determinants of current account deficits. The first column of Table 7 examines the ***stages of development*** hypothesis, which states that the size of current account deficits decreases as a country develops in relation to the rest. In other words, a poor country would tend to run large current account deficits because its investment needs cannot be met with its limited saving, but as the country develops, it requires less external financing and starts devoting resources to pay back its external debt. Our proxy for the (relative) stage of development of a given country is the log of the ratio of per capita GDP of such country to the (weighted average of) per capita GDP of industrialized countries. This ratio is expressed in logs to account for likely non-linear effects. As the first column shows, we do find a negative and significant effect of relative per capita GDP on the current account deficit, which gives support to the *stages of development* hypothesis. In the next two columns of Table 7, we assess the relevance of demographic variables in driving the current account deficit. We do this by adding to the set of explanatory variables, first the ***age dependency ratio***, and second, its components, the *young* and *old dependency ratios,* separately. Although their estimated coefficients are consistently negative, they all fail to be statistically significant. We conclude that demographic variables do not affect a country's propensity to run current account deficits beyond their effect through private saving.

Table 8 examines the effects of additional financial variables. The first column considers the effect of the ***ratio of liquid liabilities to GDP***. While this ratio mostly captures monetary and credit expansions in the short run for a given country, it represents financial depth when compared across countries and in the long run (see King and Levine 1993). The estimated coefficient is negative but not statistically significant; its negligible impact may be due to contrasting effects of financial depth on the current account deficit. On the one hand, countries

with stronger financial depth are better prepared to accommodate larger external financing; but on the other hand, these countries are also likely to have higher income and internal resources for investment. In the second column, we address the issue of macroeconomic uncertainty, proxied by the ***standard deviation of (monthly) inflation***. We do not find a significant coefficient in the cross-country effects model. Again, this could be due to contrasting effects: on the one hand, macroeconomic instability decreases domestic investment and increases saving; but on the other hand, an aspect of deficient macroeconomic policy is excessive borrowing from abroad. Finally, the last column of Table 8 considers ***external debt as ratio to GDP*** as an additional explanatory variable for current account deficits across countries. We fail to find a statistically significant coefficient. The effect of the stock of debt on its flow (which to a large extent is given by the current account deficit) is a complex relationship marked by non-linearities, asymmetries, and threshold effects. Our simple linear specification does not capture the complexity of this relationship, but such purpose is beyond the scope of this paper.

6. CONCLUSIONS

In this paper we study the empirical relationship between the current account deficit (as ratio to GNDI) and the main economic variables proposed by the theoretical and empirical literatures. Taking advantage of the pooled (time-series and cross-country) nature of our sample, we distinguish between the effects due to changes over time in the explanatory variables and those derived from cross-country differences in the same variables. We call them *within-country* and *cross-country* effects, respectively. Furthermore, taking into account that most relevant variables are jointly endogenous with the current account deficit, we implement an econometric methodology that controls for simultaneity and reverse causation. This methodology is an application of the *GMM* estimator proposed by Arellano and Bond (1991) and Arellano and Bover (1995) for dynamic models employing panel data.

Our sample consists of an unbalanced panel of 44 developing countries for the period 1966-95. We use annual data and non-overlapping five-year averages in the study of within-

country and cross-country effects, respectively. We concentrate on developing countries because the response of their current account deficit to changes in internal and external conditions is likely to be different from that of industrialized countries: whereas the latter largely face unobstructed access to financial markets, most developing countries are credit constrained. In addition, there are comparatively few studies focusing on developing countries. Our main findings are:

- There is a moderate level of persistence in the current account deficit beyond what can be explained by the behavior of its determinants. The level of persistence is much smaller in heavily-indebted countries.
- The domestic output growth rate has a positive effect on the current account deficit both within a country and across countries, indicating that the domestic growth rate is associated with a larger increase in domestic investment than in national saving.
- The growth rate of industrialized countries contributes to reduce the current account deficits of developing countries. This may occur through either an increase in the demand for developing countries' exports or a rise in investment going to other industrialized countries at the expense of external financing to developing countries. The negative effect on the current account deficit is stronger in the sample of heavily indebted countries.
- Whereas within-country changes in private and public saving rates contribute to a moderate decrease in the current account deficit, cross-country differences in either saving rate do not affect the current account deficit. This is consistent with the notion that saving differences across countries are accompanied by similar differences in domestic investment. An interesting departure of this finding is obtained for the sample of highly-indebted countries. In this group of countries, those that have larger private saving rates exhibit lower current account deficits, which may reflect the need to destine any increase in available resources to debt repayment.

- While an increase in exports for a given country lowers the current account deficit (likely through a direct effect on the trade balance), cross-country differences in the size of exports are positively linked to differences in current account deficits. The latter effect may be due to the fact that a bigger export sector signals an improved debt repayment capacity.
- Short-frequency (annual) changes in the level of restrictions on balance of payments flows do not have a significant impact on current account deficits for a given country; however, across countries and in lower frequencies, they are linked to smaller current account deficits. On the other hand, short-frequency changes in the black market premium is deficit-reducing for a given country, while across countries the black market premium is linked with higher current account deficits.
- An appreciation of the real exchange rate or a worsening of the terms of trade generate an increase in the current account deficit
- Reductions in international real interest rates generate an increase in current account deficits in developing countries. This is consistent with both an increased demand for foreign financing and a rise in the supply of foreign capital when international real interest rates are low. This result applies to the sample of all developing countries; in contrast, for the sample of heavily indebted countries, a fall in international real interest rates does not have a significant effect on the current account deficit.
- Finally, the *stages of development* hypothesis receives support from the result that countries whose per capita GDP is closer to that of industrialized countries tend to run lower current account deficits.

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Table 1
Determinants of Current Account Deficits

Category	Variable	Expected Sign	Empirical Sign
Persistence	Current Account Deficit lagged one period	+	+0.67 for CA/GDP [2] +0.50 for CA/GDP [12]
Income	Domestic Output Gap	+	+ [1]
	Country-Specific Productivity Shock: Transitory/Permanent	+ / -	+ [3,4,11,12]
	Global Specific Productivity Shock: Transitory/Permanent	+ / 0	0 [12]
	Domestic Output Growth	+	+ [8,9]
Saving/ Investment	Saving: National / Private	-	
	Investment	+	+ [2,4,12]
Fiscal Policy	Public Saving	-	- [5]
	Budget Surplus	-	- [2]
	Government Spending Shocks: Temporary / Permanent	+ / 0	0 [4]
External Indicators	Degree of Openness	Ambiguous	- [8,9]
	Real Effective Exchange Rate	Marshall-Lerner: +	+ [2]
		Intertemporal: Ambiguous	0 [11]
		Non-Monotonic	J-Curve: 0 [13]
	Terms of Trade	Harberger-Laursen-Metzler: -	- [2,7,11,12]
		Non-Monotonic	J-Curve: [6,15] S-Curve: [1,14]
	Exchange Controls	+	0 [2]
Foreign Indicators	Industrialized Countries Growth Rate	-	- [8,9]
	World Real Interest Rate	Net Debtor: - Net Creditor: +	0 [12]

Note: The empirical findings in this table summarizes: [1] Backus, Kehoe and Kehoe (1994); [2] Debelle and Faruqee (1996); [3] Elliot and Fatas (1996); [4] Glick and Rogoff (1995); [5] Leiderman and Razin (1991); [6] Mansoorian (1998); [7] Mendoza (1995); [8] Milesi-Ferreti and Razin (1996); [9] Milesi-Ferreti and Razin (1998); [10] Razin and Rose (1992); [11] Razin (1995); [12] Reisen (1998); [13] Rose and Yellen (1989); [14] Senhadji (1998); [15] Tornell and Lane (1998).

Table 2
Current Account Deficit Determinants in Developing Countries: Summary Statistics
Annual Data, 1966-1995

A. Sample of Developing Countries

Variable	Mean	Std.Dev.	Minimum	Maximum
Current Account Deficit (% GNDI)	0.0327	0.0468	-0.1224	0.1704
Internal Conditions:				
Domestic Output Growth	0.0370	0.0464	-0.1963	0.2400
Private Saving (% GNDI)	0.1329	0.0647	-0.1368	0.3133
Public Saving (% GNDI)	0.0554	0.0444	-0.1255	0.3762
External Sector:				
Exports (% GNDI)	0.2524	0.1481	0.0442	0.9619
Real Effective Exchange Rate a/	4.7483	0.3314	3.5211	6.2032
Terms of Trade a/	0.0424	0.1848	-0.5764	0.9342
Black Market Premium b/	0.1831	0.2675	-0.3314	1.7918
BoP Controls	0.5811	0.3388	0.0000	1.0000
Evolution of the World Economy:				
OECD's Output Growth	0.0281	0.0331	-0.1342	0.0624
International Real Interest Rate b/	0.0197	0.0226	-0.0406	0.0563

B. Sample of Heavily-Indebted Developing Countries

Variable	Mean	Std.Dev.	Minimum	Maximum
Current Account Deficit (% GNDI)	0.0345	0.0486	-0.1224	0.1687
Internal Conditions:				
Domestic Output Growth	0.0427	0.0828	-0.1335	0.9209
Private Saving (% GNDI)	0.1309	0.0656	-0.1368	0.3133
Public Saving (% GNDI)	0.0560	0.0448	-0.1255	0.3762
External Sector:				
Exports (% GNDI)	0.2622	0.1313	0.0515	0.7881
Real Effective Exchange Rate a/	4.7354	0.2993	3.6480	5.6846
Terms of Trade a/	0.0312	0.1849	-0.3741	0.8901
Black Market Premium b/	0.1911	0.2571	-0.3314	1.7918
BoP Controls	0.6482	0.3370	0.0000	1.0000
Evolution of the World Economy:				
OECD's Output Growth	0.0281	0.0331	-0.1342	0.0624
International Real Interest Rate b/	0.0197	0.0226	-0.0406	0.0563

C. Simple Correlation of Current Account Deficit with Determinants

Variable	Developing Countries	Heavily-Indebted Developing Countries
Persistence:		
Current Account Deficit (% of GNDI) lagged 1 year	0.66	0.67
Internal Conditions:		
Domestic Output Growth	-0.04	0.03
Private Saving (% GNDI)	-0.34	-0.38
Public Saving (% GNDI)	-0.17	-0.20
External Sector:		
Exports (% GNDI)	0.11	0.07
Real Effective Exchange Rate a/	0.11	0.25
Terms of Trade a/	-0.03	-0.01
Black Market Premium b/	0.03	0.04
BoP Controls	-0.07	-0.06
Evolution of the World Economy:		
OECD's Output Growth	-0.17	-0.03
International Real Interest Rate b/	-0.07	-0.06

a/ Expressed in logs.
b/ The variable is expressed in log(1+Variable).

Table 3
Within-Country Effects: Various Estimation Techniques
Dependent Variable: Current Account Deficit as a percentage of GNDI (CAD)
(t-Statistics are presented below their corresponding coefficients)

Type of Model:	Within	Differences (D)	System D-L
Estimation Technique:	OLS	GMM-IV	GMM-IV
Instruments:		Levels (L)	Combined L-D
	[1]	[2]	[3]
Constant	-	-	-0.1560
			-2.6146
Persistence:			
CAD lagged 1 period	0.3495	0.3084	0.3559
	7.7365	5.5698	7.6818
Internal Conditions:			
Domestic Output	0.1318	0.3397	0.2128
Growth Rate	3.6790	4.0703	4.3595
Private Saving	-0.3215	-0.4318	-0.1265
(as % of GNDI)	-7.1298	-2.6246	-1.5727
Public Saving	-0.3714	-0.6075	-0.3451
(as % of GNDI)	-6.1612	-4.5213	-5.4781
External Sector:			
Exports	-0.0170	-0.0389	-0.0362
(as % of GNDI)	-1.7173	-1.7403	-2.8576
Real Effective Exchange	-0.0036	-0.0290	0.0361
Rate (in logs)	-0.5034	-0.9893	3.4071
Terms of Trade (in logs)	-0.0059	-0.0670	-0.0465
	-0.5164	-3.1956	-3.8810
Black Market Premium (BMP)	-0.0094	0.0033	-0.0327
(in log[1+BMP])	-1.8326	0.1943	-2.8429
Balance of Payments	-0.0095	0.0023	-0.0034
Controls	-1.4483	0.1792	-0.3803
Evolution of the World Economy:			
Industrialized Output	-0.5679	-0.3883	-0.4641
Growth Rate	-7.0668	-4.0653	-6.6942
World Real Interest	-0.0711	0.1177	-0.1790
Rate (in log[1+r*])	-1.2553	0.8523	-2.3612
No. Countries	44	44	44
No. Observations	709	709	709
SPECIFICATION TESTS (P-Values)			
(a) Sargan Test		0.158	0.224
(b) Serial Correlation :			
First-Order	0.000	0.003	0.000
Second-Order	0.550	0.533	0.624
Third-Order	0.696	0.879	0.789

Observations: The Arellano-Bover (1995) System Estimator is our preferred estimator. This combines regressions in levels and differences (column 5). In addition, the definition used to define private and public saving is the consolidated non-financial public sector, adjusted for inflationary capital gains or losses.

Table 4
Within-Country Effects: Additional Financial Variables
Dependent Variable: Current Account Deficit as a percentage of GNDI (CAD)
Estimation Technique: GMM System Estimator
(t-Statistics are presented below their corresponding coefficients)

Variable	[1]	[2]	[3]	[4]
Constant	-0.1132	-0.1552	-0.1996	-0.1687
	-2.0589	-2.5294	-2.7158	-2.7402
Persistence:				
CAD lagged 1 period	0.3504	0.3699	0.4070	0.3873
	7.6106	8.5724	7.1465	8.5252
Internal Conditions:				
Domestic Output	0.2043	0.2386	0.1620	0.1553
Growth Rate	4.0352	4.8639	2.5472	3.0232
Private Saving	-0.1917	-0.1228	0.0714	-0.0160
(as % of GNDI)	-2.2494	-1.3885	0.8289	-0.1929
Public Saving	-0.3863	-0.3120	-0.2399	-0.2489
(as % of GNDI)	-5.8476	-4.3606	-3.4985	-4.2711
External Sector:				
Exports	-0.0411	-0.0598	-0.0363	-0.0455
(as % of GNDI)	-2.5828	-3.4622	-2.6254	-3.5259
Real Effective Exchange	0.0267	0.0225	0.0369	0.0652
Rate (in logs)	2.4164	1.8823	3.1733	2.7379
Real Effective Exchange				-0.0339
Rate lagged 1 period				-1.4136
Terms of Trade	-0.0405	-0.0636	-0.0576	-0.0629
(in logs)	-3.5785	-4.8917	-4.8326	-4.6784
Black Market Premium (BMF	-0.0333	-0.0372	-0.0315	-0.0315
(in log[1+BMP])	-2.9413	-3.0383	-2.6157	-2.6741
Balance of Payments	-0.0025	-0.0005	0.0086	-0.0012
Controls	-0.3278	-0.0542	1.6384	-0.1278
Evolution of the World Economy:				
Industrialized Output	-0.4208	-0.4647	-0.5531	-0.4335
Growth Rate	-6.6350	-5.6041	-6.4108	-5.7344
World Real Interest	-0.1222	-0.1372	-0.1977	-0.1827
Rate (in log[1+r*])	-1.9064	-1.6711	-2.9473	-2.3283
Additional Financial Variables:				
Standard Deviation	-0.0007			
of Inflation	-2.1529			
Liquid Liabilities as a		0.0631		
percentage of GDP		3.1356		
External Debt			0.0181	
(as % of GNP)			1.2870	
No. Countries	42	44	40	44
No. Obs.	670	672	557	709
SPECIFICATION TESTS (P-Values)				
(a) Sargan Test	0.519	0.345	0.229	0.267
(b) Serial Correlation :				
First-Order	0.001	0.001	0.000	0.000
Second-Order	0.537	0.706	0.797	0.581
Third-Order	0.747	0.959	0.998	0.496

Table 5
Within-Country Effects:
Heavily-Indebted vs. Non-Heavily Indebted Countries a/
Dependent Variable: Current Account Deficit as a percentage of GNDI (CAD)
Estimation Technique: GMM System Estimator
(t-Statistics are presented below their corresponding coefficients)

Variable	All Countries	Heavily-Indebted Developing Countries
Constant	-0.1572	-0.1772
	-2.6363	-2.5305
Persistence:		
CAD lagged 1 period	0.3954	0.4148
	7.2639	8.1906
Internal Conditions:		
Domestic Output	0.1369	0.3318
Growth Rate	1.9854	4.3298
Private Saving	0.0231	-0.1667
(as % of GNDI)	0.3200	-2.0052
Public Saving	-0.2374	-0.2917
(as % of GNDI)	-3.2528	-4.2124
External Conditions:		
Exports	-0.0394	-0.0561
(as % of GNDI)	-2.4505	-5.4291
Real Effective Exchange	0.0300	0.0365
Rate (in logs)	2.7215	2.7563
Terms of Trade	-0.0544	-0.0760
(in logs)	-4.6649	-5.2339
Black Market Premium (BMP)	-0.0336	-0.0492
(in log[1+BMP])	-2.1879	-4.3229
Balance of Payments	0.0087	-0.0015
Controls	1.2925	-0.3367
Evolution of the World Economy:		
Industrialized Output	-0.4985	-0.6423
Growth Rate	-6.6804	-4.0851
World Real Interest	-0.1829	-0.0979
Rate (in log[1+r*])	-2.3070	-1.1333
No. Countries	40	35
No. Obs.	557	434
SPECIFICATION TESTS (P-Values)		
(a) Sargan Test	0.123	0.193
(b) Serial Correlation :		
First-Order	0.000	0.007
Second-Order	0.855	0.705
Third-Order	0.957	0.959

a/ A country is classified as "heavily indebted" in a given year if it meets the following criterion in any two years of a fiv-year window: the country has either the ratio of external debt to GNP higher than 50% or the ratio of total debt service to exports greater than 25%.

Table 6

Cross-Country Effects: Heavily-Indebted vs. All Developing Countries a/

Dependent Variable: Current Account Deficit as a percentage of GNDI (CAD)

Estimation Technique: GMM System Estimator

(t-Statistics are presented below their corresponding coefficients)

Variable	All Developing Countries	Heavily Indebted Developing Countries
Constant	0.1400	0.1513
	1.5689	0.9052
Persistence		
CAD lagged 1 period	0.4684	0.2079
	4.4050	1.4785
Internal Conditions:		
Domestic Output	0.4383	0.3565
Growth Rate	1.4385	1.3884
Private Saving	-0.0417	-0.2307
(as % of GNDI)	-0.4652	-2.6212
Public Saving	0.0319	-0.1885
(as % of GNDI)	0.2165	-1.1898
External Conditions:		
Exports	0.0142	0.0155
(as % of GNDI)	2.4410	1.4944
Real Effective Exchange	-0.0159	-0.0036
Rate (in logs)	-0.8973	-0.1199
Terms of Trade	-0.0183	0.0206
(in logs)	-0.8073	0.4697
Black Market Premium (BMP)	0.0655	0.0619
(in log[1+BMP])	1.7460	1.0947
Balance of Payments	-0.0254	-0.0188
Controls	-3.0165	-0.9839
Evolution of the World Economy:		
Industrialized Output	-0.7787	-1.6470
Growth Rate	-1.5611	-2.3895
World Real Interest	-0.6590	-0.4840
Rate (in log[1+r*])	-4.0337	-2.7797
No. Countries	41	26
No. Obs.	126	68
SPECIFICATION TESTS (P-Values)		
(a) Sargan Test	0.817	0.232
(b) Serial Correlation :		
First-Order	0.220	0.436
Second-Order	0.267	0.470
Third-Order	0.766	0.642

a/ For the estimation of the cross-country effects model, we use non-overlapping five-year averages of all variables.

Table 7
Cross-Country Effects: Testing Some Popular Hypothesis
Dependent Variable: Current Account Deficit as a percentage of GNDI (CAD)
Estimation Technique: GMM System Estimator
(t-Statistics are presented below their corresponding coefficients)

Variable	[1]	[2]	[3]
Constant	0.1591	0.2232	0.2535
	1.8739	1.4799	1.2922
Persistence:			
CAD lagged 1 period	0.4204	0.5632	0.5538
	3.8088	3.0360	2.8617
Internal Conditions:			
Domestic Output	0.3918	0.4456	0.3761
Growth Rate	1.1539	1.4354	0.8618
GDP in GDP per capita with	-0.0075		
respect to OECD a/	-1.7915		
Private Saving	-0.0402	-0.0629	-0.0879
(as % of GNDI)	-0.4696	-0.6515	-0.5793
Public Saving	0.0714	-0.0261	-0.0304
(as % of GNDI)	0.4897	-0.1803	-0.2009
External Sector:			
Exports	0.0186	0.0119	0.0121
(as % of GNDI)	3.0017	1.8890	1.8525
Real Effective Exchange	-0.0223	-0.0125	-0.0104
Rate (in logs)	-1.2990	-0.6839	-0.4896
Terms of Trade	-0.0089	-0.0202	-0.0160
(in logs)	-0.3894	-0.7800	-0.5047
Black Market Premium (BMP)	0.0486	0.0776	0.0726
(in log[1+BMP])	1.2896	1.5113	1.2579
Balance of Payments	-0.0263	-0.0281	-0.0300
Controls	-2.8727	-2.3101	-2.0628
Evolution of the World Economy:			
Industrialized Output	-0.4272	-1.0101	-0.9609
Growth Rate	-0.9594	-1.6598	-1.4554
World Real Interest	-0.6200	-0.7038	-0.6889
Rate (in log[1+r*])	-3.5739	-3.7719	-3.4191
Demographic Variables:			
Age Dependency Ratio		-0.0974	
		-0.7732	
Young Dependency Ratio			-0.1124
			-0.7241
Old Dependency Ratio			-0.0186
			-0.4273
No. Countries	41	41	41
No. Obs.	126	126	126
SPECIFICATION TESTS (P-Values)			
(a) Sargan Test	0.513	0.885	0.801
(b) Serial Correlation :			
First-Order	0.219	0.329	0.374
Second-Order	0.164	0.256	0.333
Third-Order	0.910	0.763	0.714

a/ The gap in GDP per capita is computed as the log of the ratio of the GDP per capita in any developing country to the weighted average of the OECD economies.

Table 8

Cross-Country Effects: Additional Financial Variables

Dependent Variable: Current Account Deficit as a percentage of GNDI (CAD)

Estimation Technique: GMM System Estimator

(t-Statistics are presented below their corresponding coefficients)

Variable	[1]	[2]	[3]
Constant	0.12508	0.14365	0.32473
	1.27373	1.54335	1.48303
Persistence:			
CAD lagged 1 period	0.49429	0.46963	0.13144
	3.99316	4.34362	0.39207
Internal Conditions:			
Domestic Output	0.40880	0.45888	0.82144
Growth Rate	0.77543	1.51927	1.13807
Private Saving	-0.03695	-0.04066	-0.25474
(as % of GNDI)	-0.29744	-0.41187	-1.20911
Public Saving	-0.00124	-0.00821	-0.08934
(as % of GNDI)	-0.00809	-0.05126	-0.32611
External Conditions:			
Exports	0.01184	0.01694	0.02527
(as % of GNDI)	1.60694	1.92344	2.05732
Real Effective Exchange	-0.01293	-0.01202	-0.05064
Rate (in logs)	-0.66304	-0.64844	-1.17348
Terms of Trade	-0.01894	-0.01242	-0.00301
(in logs)	-0.59543	-0.56086	-0.09396
Black Market Premium (BMP)	0.05894	0.05552	0.03666
(in log[1+BMP])	0.90917	1.56397	0.92387
Balance of Payments	-0.02295	-0.02171	-0.01879
Controls	-1.42767	-2.73084	-1.10362
Evolution of the World Economy:			
Industrialized Output	-0.86004	-1.10338	0.41191
Growth Rate	-1.60246	-2.06057	0.29639
World Real	-0.62693	-0.55730	-1.08473
Interest Rate	-2.80038	-3.13778	-1.78899
Additional Financial Variables:			
Standard Deviation of	0.00004		
(monthly) Inflation	0.01025		
Liquid Liabilities		-0.02908	
(as % of GDP)		-0.75374	
External Debt			0.02918
(as % of GNP)			0.95963
No. Countries	39	40	36
No. Obs.	119	119	92
SPECIFICATION TESTS (P-Values)			
(a) Sargan Test	0.779	0.836	0.525
(b) Serial Correlation :			
First-Order	0.170	0.163	0.876
Second-Order	0.240	0.331	0.741
Third-Order	0.649	0.816	

Appendix
Sources for Ancillary Variables

External Debt. To characterize the external debt position of a country we draw the ratios of total external debt to gross national product (EDT/GNP) and total debt service to exports of goods and services (TDS/XGS) from the World Bank's World Development Report. Relying on these coefficients, we define a country as heavily-indebted if either its ratio of total external debt to GNP exceeds 0.50 or its ratio of total debt service to exports of goods and services exceeds 0.25 in at least two years within a window of 5 years. Finally, for our nested model, we construct a dummy variable that takes the value of 1 for any country and period satisfying the previous rule of thumb.

Demographics. To assess the generational accounting effects on current account, we use the age dependency ratio (number of total dependents over total population), and its components, say, the young and old dependency ratios. The data were taken from the World Bank's World Development Indicators.

Financial Deepening and Uncertainty. From Levine, Loayza and Beck (1998) we used the ratio of liquid liabilities as a percentage of GDP, while we construct the standard deviation of monthly inflation rates as a measure of uncertainty from the IMF's International Financial Statistics.

Endnotes

[1] Among them we have Kahn and Knight (1983) and Debelle and Faruqee (1996).

[2] We present the response of the current account to changes in some of its determinants in Table 1.

[3] Milesi-Ferreti and Razin (1996) define a current account position as unsustainable if the continuation of the current policy stance and/or the private sector behavior entails the need of a drastic policy shift or leads to a crisis.

[4] Based on the analysis of solvency and willingness to lend considerations, Milesi-Ferreti and Razin propose several operational indicators of current account sustainability, classified in the following groups: (i) structural features (investment/savings, economic growth, openness, composition of external liabilities, and financial structure); (ii) macroeconomic policy stance (exchange rate policy, fiscal policy, trade policy and capital account regime); (iii) political economy factors (i.e. political instability); and, (iv) market expectations.

[5] Kahn and Knight simply use OLS in their regression analysis and control for time-effects by including a time trend. They do not control for endogeneity in the regressors.

[6] Appendix 1 provides information on the additional variables used and on the data sources.

[7] Their dummy variables take the value of one when a restriction is in place for a given country and year (and zero otherwise).

[8] We use the black market premium as log(1+BMP).

[9] We chose this period length for two additional reasons. The first one is that is our sample size is quite limited in the time-series dimension; if we were to consider longer periods, the lack of sufficient degrees of freedom would prevent us from implementing our dynamic panel data procedures. The second reason is that, in using five-year periods, we are following the empirical literature on endogenous growth, where this period length is customarily used to average out cyclical fluctuations (see Caselli, Esquivel, and Lefort 1996; and, Easterly, Loayza, and Montiel 1997).

[10] Alonso-Borrego and Arellano (1996) and Blundell and Bond (1997) show that when the lagged dependent and the explanatory variables are persistent over time, lagged levels of these variables are weak instruments for the regression equation in differences. This weakness has repercussions on both the asymptotic and small-sample performance of the *differences* estimator. As persistence increases, the asymptotic variance of the coefficients obtained with the *differences* estimator rises (i.e., deteriorating its asymptotic precision). Furthermore, Monte Carlo experiments show that the weakness of the instruments produces biased coefficients in small samples. This is exacerbated with the variables' over time persistence, the importance of the specific-effect, and the smallness of the time-series dimension. An additional problem with the simple *differences* estimator relates to measurement error: Differencing may exacerbate the bias due to errors in variables by decreasing the signal-to-noise ratio (Griliches and Hausman, 1986). Blundell and Bond (1997) suggest that the use of Arellano and Bover's (1995) *system* estimator that reduces the potential biases and imprecision associated with the usual *differences* estimator.

[11] Given that lagged levels are used as instruments in the differences specification, only the most recent difference is used as instrument in the levels-specification. Other lagged differences would result in redundant moment conditions. (Arellano and Bover 1995)

[12] The weighting matrix for GMM estimation can be any symmetric, positive-definite matrix, and we obtain the most efficient GMM estimator if we use the weighting matrix corresponding to the variance-covariance of the moment conditions. Since this variance-covariance is unknown, Arellano and Bond (1991) and Arellano and Bover (1995) suggest the following two-step procedure. First, assume that the residuals, $\varepsilon_{i,t}$, are independent and homoskedastic both across countries and over time. This assumption corresponds to a specific weighting matrix that is used to produce first-step coefficient estimates. We construct a consistent estimate of the variance-covariance matrix of the moment conditions with the residuals obtained in the first step, and we use this matrix to re-estimate our parameters of interest (i.e. second-step estimates). Asymptotically, the second-step estimates are superior to the first-step ones in so far as efficiency is concerned. In this paper the moment conditions are applied such that each of them corresponds to all available periods, as opposed to each moment condition corresponding to a particular time period. In the former case the number of moment conditions is independent of the number of time periods, whereas in the latter case, it increases more than proportionally with the number of time periods. Most of the literature dealing with GMM estimators applied to dynamic models of panel data treats the moment conditions as applying to a particular time period. This approach is advocated on the grounds that it allows for a more

flexible variance-covariance structure of the moment conditions (see Ahn and Schmidt 1995). Such flexibility is achieved without placing a serious limitation on the degrees of freedom required for estimation of the variance-covariance matrix because the panels commonly used in the literature have both a large number of cross-sectional units and a small number of time-series periods (typically not more than five). We have, however, chosen to work with the more restricted application of the moment conditions (each of them corresponding to all available time periods) because of a special characteristic of our panel, namely, its large time-series dimension (for some countries in our sample, we work with as many as 20 time-series observations). This approach allows us to work with a manageable number of moment conditions, so that the second-step estimates, which rely on estimation of the variance-covariance matrix of the moment conditions, do not suffer from over-fitting biases (see Altonji and Segal 1994, and Ziliak 1997).

[13] Given that our model is dynamic, the data transformation involved in the within estimator also introduces a correlation between the transformed error term and the lagged dependent variable, which may lead to significant biases when the time-dimension of the data is not large.

[14] As explained in the section on methodology, the fact that the differenced error term is first-order but not higher-order serially correlated implies that the error term in levels does not follow a random walk and is not serially correlated.

[15] For further empirical evidence on CAD stationarity, see Sheffrin and Woo, 1992; Ghosh and Ostry, 1995; and Debelle and Faruqee, 1996.

[16] Theoretically, this non-monotonically relationship (consistent with the J-curve pattern) could be derived from models with voracity effects (Tornell and Lane, 1998) or models of consumption with habits developed over the flow of services of durable goods (Mansoorian, 1998).

[17] Empirical evidence on the J-curve for developed countries is also mixed. Rose and Yellen (1989) found no support for the J-curve, whereas Marquez (1991) and Backus et al. (1994) found evidence in favor of the J-curve.

[18] According to the Harberger-Laursen-Metzler effect, adverse transitory terms of trade shocks produce a decline in current income that is greater than that in permanent income. Hence, a decline in savings follows and, thus, a deterioration in the CA position ensues.

[19] The size of the export sector leads to a greater willingness to honor debt commitments since the possibility of trade disruptions raises the cost of debt default for the more open economies. Likewise, a weak export sector hinders the ability of the country to sustain external imbalances.

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